

## CLAIMS

What is claimed is:

1. A connection system for connecting a hemostasis valve to a splittable sheath, the system comprising:
  - a hemostasis valve having a first engagement means disposed on a distal end thereof;
  - a splittable sheath defining a lumen and having a second engagement means disposed on a proximal end thereof;
  - an adapter fitting comprising:
    - a shaft defining a lumen, the shaft having a proximal end and a distal end;
    - a third engagement means on an external surface of the proximal end of the shaft for engagement with the first engagement means of the hemostasis valve;
    - a cannula portion forming the distal end of the shaft for interfacing with the lumen of the splittable sheath, wherein the lumen is adapted to receive the cannula portion;
    - at least one wedge disposed on an external surface of the cannula portion for interfacing with a weakened portion of the splittable sheath; and
    - a sliding connector disposed about the shaft of the adapter fitting, the sliding connector defining an opening through which the proximal end of the shaft protrudes, the sliding connector further comprising a fourth engagement means for engagement with the second engagement means of the splittable sheath.
2. The system of claim 1, wherein the splittable sheath further comprises a nipple extending proximally therefrom and wherein the second engagement means is disposed upon the nipple.
3. The system of claim 1 further comprising a sealing means that interfaces between an interior surface of the sliding connector and a proximal surface of the cannula portion of the adapter fitting.
4. The system of claim 1, wherein the at least one wedge comprises two wedges located on 180° apart about an outer surface of the cannula portion of the adapter fitting.

5. The system of claim 2, wherein the at least one wedge comprises two wedges located on 180° apart about an outer surface of the cannula portion of the adapter fitting; and wherein each of the two wedges interfaces with an opposing weakened portion of the nipple.

6. The system of claim 3, wherein the interface between the fourth engagement means of the sliding connector, the sealing means, and the second engagement means of the splittable sheath provides for a first level of engagement resulting in a fluid seal between sliding connector, the adapter fitting, and the splittable sheath and further provides for a second level of engagement wherein the at least one wedge initiates separation of the splittable sheath.

7. A connection system for connecting a hemostasis valve to a splittable sheath, the system comprising:

- a hemostasis valve having an internally threaded exit lumen disposed on a distal end thereof;

- a splittable sheath having an externally threaded nipple disposed on a proximal end thereof;

- an adapter fitting comprising:

- a shaft defining a lumen, the shaft having a proximal end and a distal end;
  - threading on an external surface of the proximal end of the shaft for engagement with the internally threaded exit lumen of the hemostasis valve;

- a cannula portion forming the distal end of the shaft for interfacing with the splittable sheath;

- at least one wedge disposed on an external surface of the cannula portion for interfacing with a weakened portion of the splittable sheath; and

- a sliding connector disposed about the shaft of the adapter fitting, the sliding connector defining an opening through which the proximal end of the shaft protrudes, the sliding connector further comprising internal threading for engagement with the externally threaded nipple of the splittable sheath.

8. The system of claim 7 further comprising an elastomeric O-ring that interfaces between an interior surface of the sliding connector and a proximal surface of the cannula portion of the adapter fitting.

9. An adapter fitting for use in a connection system for connecting a hemostasis valve to a splittable sheath, the adapter fitting comprising:

a shaft defining a lumen, the shaft having a proximal end and a distal end;

threading on an external surface of the proximal end of the shaft for engagement with a hemostasis valve;

a cannula portion defining the distal end of the shaft for interfacing with a lumen in a splittable sheath;

a wedge disposed on an external surface of the cannula portion for interfacing with a weakened portion of the splittable sheath.

10. The adapter fitting of claim 9 further comprising a sliding connector disposed about the shaft, the sliding connector defining an opening through which the proximal end of the shaft protrudes, wherein the sliding connector is provided for engagement with the splittable sheath.

11. The adapter fitting of claim 10, wherein the sliding connector further comprises:

a proximal end and a distal end;

an annular lip extending radially inward at the proximal end for engagement with and retention by a proximal end of the cannula portion;

an engagement means at the distal end for engaging an opposing mating component of the splittable sheath

12. The adapter fitting of claim 11, wherein the cannula portion is in the form of a frustrum tapering distally.

13. The adapter fitting of claim 12, wherein the diameter of the proximal end of the frustrum of the cannula portion is larger than the diameter of a middle portion of the shaft thereby defining an annular shelf and wherein the annular lip of the sliding connector interfaces with the annular shelf.

14. The adapter fitting of claim 13, further comprising an elastomeric O-ring disposed within the sliding connector to interface between the annular lip and the annular shelf to create a fluid-tight connection.

15. The adapter fitting of claim 10, wherein the sliding connector comprises an internally threaded nut to engage with an opposing mating component of the splittable sheath.